

Nonsense on Stilts: How To Tell Science from Bunk by Massimo Pigliucci. The University of Chicago Press, 2010. 336 pp. \$20 (paperback). ISBN 9780226667867.

While its declared goal is to "allow us to tell the difference between it [science] and bunk, *Nonsense on Stilts* contains, unfortunately, its own bunk which makes the (borrowed) title apply to the book itself in addition to what is described in it. Here are some examples of "nonsense on stilts":

—p. 63: *The earth . . . has an axis of rotation (which causes the alternation of day and night) and an axis of revolution (around the sun). These two axes are not parallel, but diverge by a little more than 23°. . .*

Each of those two sentences is bunk:

- 1) There is no such a thing as an *axis of revolution around the sun*. The Earth is revolving around the sun on an *elliptical path that has two axes*.
- 2) Following the error in the first sentence, here comes the error about the angle of *a little more than 23°*. In reality, Pigliucci seems to describe the Earth's obliquity or tilt angle. The tilt angle can be defined not as he defined it, but by one of the following statements:
 - a. The angle the Earth's axis of rotation makes with a line perpendicular to the plane of the ecliptic, or
 - b. The angle that a plane passing through the Earth's equator makes with the plane of the ecliptic

—p. 93: *This is simply false, as the idea of a temporary cooling of the earth's temperature was advanced in the popular press (not in academic, peer-reviewed journals) . . .*

At least a dozen papers, discussing the idea of a temporary global cooling were published, in the mid-1970s, in academic, peer-reviewed journals, such as *Nature*, *Science*, and the *Journal of Atmospheric Research* (see below).

Barrett, E. W. (1971). Depletion of short-wave irradiance at the ground by particles suspended in the atmosphere. *Sol. Energy*, 13, 323–337.

Bryson, R. A. (1974). A perspective on climatic change. *Science*, 184, 753–760.

Bryson, R. A., & Dittberner, G. J. (1977). Reply. *J. Atmos. Sci.*, 34, 1821–1824.

Bryson, R. A., & Dittberner, G. J. (1976). A non-equilibrium model of hemispheric mean surface temperature. *J. Atmos. Sci.*, 33, 2094–2106.

Bryson, R. A., & Murray, T. J. (1977). *Climates of Hunger: Mankind and the*

World's Changing Weather. American University Publishers Group, 171 pp.

Bryson, R. A., & Wendland, W. M. (1970). Climatic effects of atmospheric pollution. In S. F. Singer (Ed.), *Global Effects of Environmental Pollution*, Springer-Verlag/D. Reidel, pp. 130–138.

Chýlek, P., & Coakley, J. A., Jr. (1974). Aerosols and climate. *Science*, 183, 75–77.

Hamilton, W. L., & Seliga, T. A. (1972). Atmospheric turbidity and surface temperature on the polar ice sheets. *Nature*, 235, 320–322.

Kukla, G. J., & Kukla, H. J. (1974). Increased surface albedo in the Northern Hemisphere. *Science*, 183, 709–714.

McCormick, R. A., & Ludwig, J. H. (1967). Climate modification by atmospheric aerosols. *Science*, 156, 1358–1359.

Rasool, S. I., & Schneider, S. H. (1971). Atmospheric carbon dioxide and aerosols: Effects of large increases on global climate. *Science*, 173, 138–141.

Twomey, S. (1977). The influence of pollution on the shortwave albedo of clouds. *J. Atmos. Sci.*, 34, 1149–1152.

—p. 136: . . . *we do have an atmosphere, and carbon dioxide (CO₂) is a major component of it.*

This is a huge “nonsense on stilts”: *CO₂ represents only 0.039% of the entire atmosphere.* Even if Pigliucci meant to say that CO₂ is a major greenhouse gas, he would be wrong by two orders of magnitude, because the most important greenhouse gas is water vapors (1%–4% concentration).

The next comments refer to Pigliucci's criticism of Bjorn Lomborg's book *The Skeptical Environmentalist*.

—On p. 137, Pigliucci writes: *We will go into a bit of detail analyzing one chapter [emphasis added] of Lomborg's book . . . because it represents a good example of how science can be used to oversimplify complex topics and how hundreds of pages and thousands of notes do not necessarily make good scholarship.*

In other words, by analyzing one chapter out of twenty-five or 66 pages out of 515 pages, Pigliucci hopes to show that the remaining hundreds of pages and thousands of notes do not necessarily make good scholarship because of one bad chapter. This is a logical fallacy called *hasty generalization*, and it is weird when it comes from a philosopher of science who wrote a book about “nonsense on stilts” trying to debunk such kinds of misconceptions.

—On p. 138, Pigliucci tells us that *Lomborg is not a climate scientist . . . Why, then, attempt to write a scholarly book about the “true” state of the environment?*

HINT: read p. xx of Lomborg’s Preface. Another hint: Pigliucci himself is not a climate scientist, but he expresses opinions like a climate scientist. Unfortunately, many of them are deadly wrong.

—On p. 139, Pigliucci writes: . . . *Lomborg’s own book—though published by the prestigious Cambridge University Press—has not been reviewed by a single natural scientist . . .*

Nor do we know if a single philosopher of science has reviewed *Nonsense on Stilts!* But if we read Lomborg’s Acknowledgements, we will find no fewer than five scientists who can qualify as “natural scientist” (professor of geology Henning Sørensen, Ed Dlugokencky and P. Tans from the Climate Monitoring and Diagnostics Laboratory of the US National Oceanic and Atmospheric Administration, John H. Dyck from the US Department of Agriculture, and Dr. Johann Glodammer at the Max Plank Chemistry Institute). These scientists as well as many others listed in the Acknowledgements “commented on large parts of the book.”

—On p. 139, Pigliucci writes: “*The claim that the temperature is higher now than at any time throughout the past 1,000 years seems less well substantiated. He is technically correct, as we are in fact coming out of a so-called Little Ice Age, but his own graph of the data shows remarkable convergence of estimates from various studies showing not only a steady increase in temperatures over time, but a recent steep rise that seems compatible only with an anthropogenic explanation.*”

Is Lomborg contradicting himself? According to Pigliucci, the answer is yes. But, if we go back to Lomborg’s book (pages 260–263, Figure 134) we will notice that Pigliucci did not pay attention to criticism made by Lomborg with regard to one set of temperature data (Mann, M. E., Bradley, R. S., & Hughes, M. K. (1999). Northern hemisphere temperatures during the past millennium: Inferences, uncertainties, and limitations. *Geophysical Research Letters* 26(6), 759). That set of data illustrates the infamous “hockey stick,” where the Little Ice Age was completely obliterated to make “the recent steep rise” in temperature more obvious. Probably, Pigliucci does not know (remember, he is not a climate scientist by his own recognition) that the “hockey stick” model was discredited a long time ago, that its author himself, Michael Mann, dropped it, and that the latest IPCC report in 2007 no longer includes it. What is remarkable, however, is that Lomborg, in 2001, advances plenty of reasons for which Mann’s temperature data should be regarded with skepticism. And the recent “Climategate” scandal clouded Mann’s work even more. But Pigliucci

seems to ignore what happened between 2001 and 2010 in order to win the point against Lomborg.

—Referring to Figure 146 of the first book, Pigliucci writes on p. 142: *Let us set aside for the moment the non-negligible detail that there is very little understanding of the causal link between sunspots and global temperatures (and without a well-established causal link, a correlation is just an interesting but potentially misleading statistic).*

Apparently, Pigliucci never heard about Maunder and Sporer sunspot minima and their links to the Little Ice Age in the Northern hemisphere. He does not know either that some scientists suggested that changes in solar irradiance accounted for 50%–75% of the 0.6°C increase in temperature during the 1900s and that other scientists (such as the famous P. D. Jones and M. E. Mann from the infamous “Climategate”) place the solar irradiance changes since 1880 at about 10% of the amount of 0.7°C warming during the last century.

—On p. 142, Pigliucci writes: *Lomborg adds: “however, these are global figures over the next 63 years [this is an odd number to pick; your baloney detector should go yellow alert]. . .*

In fact, my baloney detector went again straight to red alert because he (voluntarily or not, who knows?) misrepresented that number. It’s not odd at all if he noticed that Lomborg refers to a Canadian report published in 1997 dealing with overall cost until 2060 of the implementation of the CFC protocols. You do not have to have a PhD to realize that 2060 – 1997 = 63 years. “It’s elementary, my dear Watson . . .”

—Regarding again Lomborg’s Figure 146, Pigliucci writes (p. 142) that *Lomborg glosses over the fact that the otherwise very good match between the two curves he shows (. . .) completely breaks down during the last few decades, with temperatures continuing to increase regardless of the solar cycle.*

But on p. 278 of his book, Lomborg writes that *the connection between temperature and the sunspot cycle seems to have deteriorated during the last 10–30 years, with temperatures outpacing sunspot activity in Figure 146.* Is this “glossing”? I would argue that Lomborg is aware of the disconnection between the two curves, and indeed he in fact “draws readers’ attention to this annoying detail.”

—Continuing the critique of the same Figure 146, Pigliucci writes (p. 143): *He [Lomborg] attributes this to an “emerging greenhouse gas signal,” that is to human-caused global warming!*

Going back to Lomborg’s book on page 278 (Pigliucci’s endnote #11

gives the wrong page for the above-quoted words), one can read the following:
... the fact that the emerging greenhouse gas signal only appears now seems to indicate once again that the estimated CO₂ warming effect needs to be lowered. One such IPCC-loyal study finds that the solar hypothesis explains about 57 percent of the temperature variations and that the data suggest a climate sensitivity of 1.7°C, a 33 percent reduction of the IPCC best estimate. It seems to me that Lomborg says quite the opposite of what Pigliucci is claiming.

—On p. 142, Pigliucci pokes fun at Lomborg: *... His example [of a better technology]? At the beginning of the twentieth century icebergs were considered "a major climatic threat impeding travel between North America and Europe." But all it took was for us to invent jet liners and, voilà, no more Titanics. Hardly the sort of argument that belongs in a scholarly book.*

I would argue that this is a cheap shot. Because Lomborg, citing the *Titanic* example from the literature, explains in the next paragraph why he chose that metaphor (p. 278): *To remain with the metaphor above, it seems that the scenarios are more concerned about plotting a better course for the Titanic than investigating the likelihood of alternative means to travel.* It is Pigliucci's right to not include this sort of argument in one his scholarly books, but, personally, I appreciate the power of a well-chosen metaphor.

—On p. 144, Pigliucci writes: *I guess that was why in 2003 ... thirty-five thousand people died in Europe (not in central Africa) during a heat wave ...*

While this is a gruesome number when talking about victims of a heat wave and, by extension, of possible consequences of global warming, I am wondering why Pigliucci is not quoting the following: *In Europe as a whole, about two hundred thousand people die from excess heat each year. However, about 1.5 million Europeans die annually from excess cold. That is more than seven times the total number of heat deaths. Just in the past decade, Europe has lost about fifteen million people to the cold, more than four hundred times the iconic heat deaths from 2003. That we so easily neglect these deaths and so easily embrace those caused by global warming tell us of a breakdown in our sense of proportion* (Bjorn Lomborg, *Cool It*, 2007:17).

—On p. 146, Pigliucci writes: *Lomborg quotes with disdain* [emphasis added] *University of California Berkeley's physicist John Holdren (later director of the White House Office of Science and Technology Policy under President Obama), who pointed out that the major problem we have for the future isn't a lack of energy, but how we use it.*

Going back to Lomborg's book on p. 321, we read: *UC Berkeley physicist*

John Holdren pointed out that "clean-burning, non polluting, hydrogen-using bulldozers still could knock down trees or build housing developments on farmland." Now, could somebody tell me, where is the disdain here?

I declare I stopped reading *Nonsense on Stilts* after Chapter 6 because of a quote used by Pigliucci himself when discussing Lomborg's book. According to Thomas Henry Huxley, "many a beautiful theory was killed by an ugly fact." I cannot think of a more appropriate quote for Pigliucci's book.

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Nonsense on Stilts, by Massimo Pigliucci, takes its name from a quote by Jeremy Bentham, the English utilitarian philosopher. The book aims to provide the average person with the tools required to differentiate science from non-science—a classic problem in philosophy of science. Massimo Pigliucci is both a scientist and a philosopher as, according to his bio at platofootnote.org, he holds a doctorate and two Ph.D.s—in genetics, evolutionary biology, and philosophy. He is currently a professor at the City University of New York and "noted skeptic."

The writing style of *Nonsense on Stilts* is readable and accessible to those who don't have a philosophy or scientific background, and some sections are bound to be informative even if you do, as the scope of the book is huge. It contains information about basic philosophy of science to the representation of science in the media as well as discussions about controversial scientific topics in politics and the courtroom (global warming and intelligent design, respectively). It also contains a quick rundown on the history of the development of science as a break-away discipline from the grips of theology and philosophy (from the pre-Socratics to the founding of modern science). And he also manages to cover more current developments in philosophy of science with two chapters dedicated to the "science wars" and finally a chapter where he discusses the role of the expert.

He skillfully manages to cover this extensive ground while making the book an enjoyable, easy read. His apparently affable personality shines through

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